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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/683,418	12/26/2001	Norman W. Zeck	104182	3034

27074 7590 02/04/2005

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EXAMINER	
THOMPSON, JAMES A	
ART UNIT	**PAPER NUMBER**
2624	

DATE MAILED: 02/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/683,418	Applicant(s) ZECK ET AL.	
	Examiner James A Thompson	Art Unit 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 July 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) ____ is/are pending in the application.

4a) Of the above claim(s) ____ is/are withdrawn from consideration.

5)☐ Claim(s) ____ is/are allowed.

6)☒ Claim(s) *1-5,7-9,11-14 and 16-21* is/are rejected.

7)☐ Claim(s) ____ is/are objected to.

8)☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 December 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. ____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date ____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. ____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: ____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 15 July 2005 have been fully considered but they are not persuasive.

Regarding page 7, lines 12-20: As clearly shown on page 3, lines 1-8 of the first office action, dated 07 May 2004, the contrast index (CI) taught by Tai (US Patent 5,729,632) is the selection indicator. If said selection indicator is such that blending does not occur, then the halftone image data is passed without changes. The process of blending two different halftone screens, which have different properties from one another (column 7, line 65 to column 8, line 4 of Tai), will cause the halftone data to pass with some changes since the blending of said halftone screens generates changes in how the halftone image data is rendered, and thus changes the resultant halftone image data itself.

Regarding page 7, line 20 to page 8, line 7: Examiner has not argued that Crean (5,745,249) specifically teaches the use of a selection indicator, as Applicant has stated. The use of said selection indicator is a teaching drawn from Tai. As specifically argued on page 4, lines 16-22 of said first office action, Crean teaches "that a digital logic circuit (figure 4 (44) and column 6, lines 37-41 of Crean) selects at least a portion of the halftone image data and replicates the selected portion of the halftone image data to produce replicated halftone image data (column 7, lines 50-54 of Crean)." To further clarify, the portion of the halftone image which corresponds to the area selected by the Holladay block that is generated, including the offset, is used to replicate said

portion of the halftone image data (column 7, lines 51-54 and lines 58-61 of Crean). The manner in which Tai and Crean are combined, along with the corresponding motivation to combine, is clearly set forth on page 5, lines 1-9 of said first office action.

Regarding page 8, line 8 to page 9, line 13: The lookup table is specifically taught by Tai, as discussed in the arguments regarding claim 8 and the arguments regarding claim 14 in said first action. The clustered-dot halftone screen (column 9, lines 60-63 of Wang (US Patent 5,859,955)) and stochastic halftone screen (column 10, lines 45-50 of Wang) are clearly taught by Wang, as discussed on page 13 of said first office action. The manner in which these teachings are combined is discussed in detail in the present office action in the arguments regarding claim 8 and the arguments regarding claim 14.

The remainder of Applicant's arguments are directed to the amendments made to the claims and not to the claims as originally filed. Since claims 8 and 14 have been amended to incorporate the limitations that were originally recited in cancelled claims 10 and 15, and since claims 10 and 15 were rejected in said first office action as being obvious over Tai in view of Crean and Wang, it is unreasonable to expect that claims 8 and 14 as now filed would be fully taught by Tai in view of Crean. A discussion of the rejections of claims 8 and 14 over the prior art is specifically discussed below.

Regarding page 9, line 14 to page 10, line 10: The amendments to claim 4 which further limit the look-up table are the same as the amendments to claims 8 and 14 which further

limit the look-up table. Therefore, Applicant is referred to the arguments above regarding page 8, line 8 to page 9, line 13.

Regarding page 10, line 11 to page 11, line 6: Curry (US Patent 5,696,604) overcomes the deficiencies of Tai in view of Crean with regard to claims 3, 9 and 18, as specifically discussed on page 17, line 1 to page 18, line 2 of said first office action. Curry also overcomes the deficiencies of Tai in view of Crean and Wang with regard to claim 7, as specifically discussed on page 18, line 4 to page 19, line 2 of said first office action. Applicant has not given any substantive and compelling reason why Curry would fail to do so.

Oath/Declaration

2. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

> The oath or declaration is defective because:
> It does not identify the mailing address of each inventor. A mailing address is an address at which an inventor customarily receives his or her mail and may be either a home or business address. The mailing address should include the ZIP Code designation. The mailing address may be provided in an application data sheet or a supplemental oath or declaration. See 37 CFR 1.63(c) and 37 CFR 1.76.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 11 and 12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point

out and distinctly claim the subject matter which applicant regards as the invention.

Claims 11 and 12 both recite "[t]he method of claim 10" when, in fact, claim 10 has been cancelled. There is therefore no antecedent basis for "[t]he method of claim 10" as recited in claims 11 and 12. Claims 11 and 12 are therefore indefinite.

5. Claims 16 and 17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 16 and 17 both recite "[t]he method of claim 15" when, in fact, claim 15 has been cancelled. There is therefore no antecedent basis for "[t]he method of claim 15" as recited in claims 16 and 17. Claims 16 and 17 are therefore indefinite.

Claim Rejections - 35 USC §103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tai (US Patent 5,729,632) in view of Crean (US Patent 5,745,249).

Regarding claim 1: Tai discloses a digital halftoning system (figure 6 and column 6, lines 7-9 of Tai) that converts

continuous tone image data to halftone image data (column 15, lines 46-50 of Tai).

Said system comprises a selection circuit (figure 6(150) and column 7, lines 8-10 of Tai) that selects one of a plurality of dot types (column 7, line 65 to column 8, line 4 of Tai) based on a selection indicator (CI) (column 9, lines 7-13 of Tai). Figure 1 is the blending screen logic control (figure 6(150) and column 7, lines 8-10 of Tai), which is also the prior art system of US Patent 5,200,831 (column 2, lines 52-53 of Tai). Said blending screen logic control selects one of a plurality of dot types (column 7, line 65 to column 8, line 4 of Tai) depending upon the local contrast index (column 9, lines 7-13 of Tai).

Said system further comprises a look-up table (figure 1(14) of Tai) having a plurality of halftone screens, specifically grayscale screen 1 (column 8, lines 23-26 of Tai), grayscale screen 2 (column 8, lines 26-30 of Tai), grayscale screen 3 (column 8, lines 30-33 of Tai), and grayscale screen 4 (column 8, lines 38-42 of Tai). Said grayscale screens must stored in the memory (figure 1(14) of Tai) of the blending screen logic control (figure 6(150) and column 7, lines 8-10 of Tai) in order to be accessed. Since said grayscale screens are accessed based on a result of said selection indicator (column 9, lines 7-13 of Tai), the area of memory in which said grayscale screens are stored would constitute a look-up table. Said look-up table outputs halftone image data based on the selected dot type and the continuous tone image data (column 9, lines 59-65 of Tai).

Said system further comprises a digital logic circuit (figure 6(160) of Tai) that receives the halftone image data (column 7, lines 3-6 of Tai), and that, based on the selection

indicator (CI), passes the halftone image data without changes (column 9, lines 7-13 of Tai). The unified rendering unit (figure 6(160) of Tai) renders the halftone image based on the blended halftone screen determined by the contrast index (column 9, lines 7-13 of Tai).

Tai does not disclose expressly a plurality of Holladay counters; that said selection circuit select one of the plurality of Holladay counters based on a selection indicator; that said look-up table outputs halftone image data based on a state of the selected Holladay counter; and that said digital logic circuit can also select at least a portion of the halftone image data and replicate the selected portion of the halftone image data to produce replicated halftone image data.

Crean discloses a plurality of Holladay counters (figure 9(40M,40N) and column 8, lines 23-27 of Crean), which is selected by a selection circuit (figure 9(60) of Crean) based on a selection indicator (column 8, lines 31-35 of Crean).

Crean further discloses that a look-up table (figure 4(50) of Crean) outputs halftone image data (column 7, lines 10-12 of Crean) based on a state of the selected Holladay counter (column 7, lines 7-10 of Crean).

Crean further discloses that a digital logic circuit (figure 4(44) and column 6, lines 37-41 of Crean) selects at least a portion of the halftone image data and replicates the selected portion of the halftone image data to produce replicated halftone image data (column 7, lines 50-54 of Crean). The dot address sequencer (figure 4(44) of Crean) of the selected Holladay sequencer (figure 4(40) of Crean) replicates at least a portion of the halftone image data by laying out

bricks in a tile format (column 7, lines 50-54 of Crean) with various offsets (column 7, lines 58-61 of Crean).

Tai and Crean are combinable because they are from the same field of endeavor, namely halftone image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the plurality of Holladay counters taught by Crean to tile, with various offsets, the halftone screens taught by Tai. The particular Holladay counter would be selected by the selection indicator (CI) since said selection indicator is used to determine the dot type used in the halftoning process. The motivation for doing so would have been to increase the efficiency and speed of the halftoning process (column 2, lines 33-37 of Crean). Therefore, it would have been obvious to combine Crean with Tai to obtain the invention as specified in claim 1.

8. Claims 2, 4-5, 8, 11-14, 16-17 and 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tai (US Patent 5,729,632) in view of Crean (US Patent 5,745,249) and Wang (US Patent 5,859,955).

Regarding claim 2: Tai discloses a plurality of halftone screens (column 10, lines 2-9 of Tai).

Tai in view of Crean does not disclose expressly that said plurality of halftone screens includes at least a clustered-dot halftone screen and a stochastic halftone screen.

Wang discloses using a clustered-dot halftone screen (column 9, lines 60-63 of Wang) and a stochastic halftone screen (column 10, lines 45-50 of Wang).

Tai in view of Crean is combinable with Wang because they are from the same field of endeavor, namely halftone image

processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use clustered-dot halftone screens and stochastic halftone screens, as taught by Wang, for the plurality of halftone screens taught by Tai. The motivation for doing so would have been that clustered-dot halftone screens are more color stable (column 9, lines 48-49 of Wang) and stochastic halftone screens provide more gray levels (column 9, lines 45-46 of Wang). Therefore, it would have been obvious to combine Wang with Tai in view of Crean to obtain the invention as specified in claim 2.

Further regarding claim 20: Crean discloses that said Holladay counters are used to generate the state for indexing into the said halftone screens (column 8, lines 23-27 of Crean). Therefore, selecting the stochastic Holladay counter would inherently result in the implementation of the stochastic halftone screen.

Regarding claim 4: Tai discloses a digital halftoning system (figure 6 and column 6, lines 7-9 of Tai) that converts continuous tone image data to halftone image data (column 15, lines 46-50 of Tai).

Said system comprises a selection circuit (figure 6(150) and column 7, lines 8-10 of Tai) that selects one of a plurality of dot types (column 7, line 65 to column 8, line 4 of Tai) based on a selection indicator (CI) (column 9, lines 7-13 of Tai). Figure 1 is the blending screen logic control (figure 6(150) and column 7, lines 8-10 of Tai), which is also the prior art system of US Patent 5,200,831 (column 2, lines 52-53 of Tai). Said blending screen logic control selects one of a plurality of dot types (column 7, line 65 to column 8, line 4 of

Tai) depending upon the local contrast index (column 9, lines 7-13 of Tai).

Said system further comprises a look-up table (figure 1(14) of Tai) having a plurality of halftone screens, specifically grayscale screen 1 (column 8, lines 23-26 of Tai), grayscale screen 2 (column 8, lines 26-30 of Tai), grayscale screen 3 (column 8, lines 30-33 of Tai), and grayscale screen 4 (column 8, lines 38-42 of Tai). Said grayscale screens must stored in the memory (figure 1(14) of Tai) of the blending screen logic control (figure 6(150) and column 7, lines 8-10 of Tai) in order to be accessed. Since said grayscale screens are accessed based on a result of said selection indicator (column 9, lines 7-13 of Tai), the area of memory in which said grayscale screens are stored would constitute a look-up table. Said look-up table outputs halftone image data based on the selected dot type and the continuous tone image data (column 9, lines 59-65 of Tai).

Said system further comprises a digital logic circuit (figure 6(160) of Tai) that receives the halftone image data (column 7, lines 3-6 of Tai), and that, based on the selection indicator (CI), passes the halftone image data without changes (column 9, lines 7-13 of Tai). The unified rendering unit (figure 6(160) of Tai) renders the halftone image based on the blended halftone screen determined by the contrast index (column 9, lines 7-13 of Tai).

Said system further comprises a comparator (figure 6(160) of Tai) that compares each of the threshold image values of the set (halftone screen) from said look-up table to the continuous-tone image data to produce halftone image data (column 7, lines 28-34 of Tai). The unified rendering controller (figure 6(160) of Tai) also compares the input image values with a halftone

screen (column 7, lines 29-31 of Tai) and renders said values as a halftone image (column 7, lines 31-34 of Tai).

Tai does not disclose expressly a plurality of Holladay counters; that said selection circuit select one of the plurality of Holladay counters based on a selection indicator; that said look-up table outputs a set of threshold values based on a state of the selected Holladay counter and the look-up table includes at least one clustered-dot halftone screen and at least one stochastic halftone screen; and that said comparator is a separate unit.

Crean discloses a plurality of Holladay counters (figure 9(40M,40N) and column 8, lines 23-27 of Crean), which is selected by a selection circuit (figure 9(60) of Crean) based on a selection indicator (column 8, lines 31-35 of Crean).

Crean further discloses that a look-up table (figure 4(50) of Crean) outputs halftone image data (column 7, lines 10-12 of Crean) based on a state of the selected Holladay counter (column 7, lines 7-10 of Crean).

Tai and Crean are combinable because they are from the same field of endeavor, namely halftone image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the plurality of Holladay counters taught by Crean to tile, with various offsets, the halftone screens taught by Tai. The particular Holladay counter would be selected by the selection indicator (CI) since said selection indicator is used to determine the dot type used in the halftoning process. The motivation for doing so would have been to increase the efficiency and speed of the halftoning process (column 2, lines 33-37 of Crean). Therefore, it would have been obvious to combine Crean with Tai.

Tai in view of Crean does not disclose expressly that said look-up table includes at least one clustered-dot halftone screen and at least one stochastic halftone screen; and that said comparator is a separate unit.

Wang discloses using a clustered-dot halftone screen (column 9, lines 60-63 of Wang) and a stochastic halftone screen (column 10, lines 45-50 of Wang); and a comparator (figure 5(10) of Wang) as a separate unit (column 6, lines 44-48 of Wang).

Tai in view of Crean is combinable with Wang because they are from the same field of endeavor, namely halftone image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use a comparator as a separate unit. The motivation for doing so would have been to be able to direct the flow of halftone image data to one of a plurality of different units depending upon what is required (column 6, lines 48-50 of Wang). Further, it would have been obvious to a person of ordinary skill in the art at the time of the invention to use clustered-dot halftone screens and stochastic halftone screens, as taught by Wang, in the look-up table taught by Tai. The motivation for doing so would have been that clustered-dot halftone screens are more color stable (column 9, lines 48-49 of Wang) and stochastic halftone screens provide more gray levels (column 9, lines 45-46 of Wang). Therefore, it would have been obvious to combine Wang with Tai in view of Crean to obtain the invention as specified in claim 4.

Regarding claim 5: Tai discloses a digital logic circuit (figure 6(160) of Tai) that receives the halftone image data (column 7, lines 3-6 of Tai), and that, based on the selection indicator (CI), passes the halftone image data without changes

(column 9, lines 7-13 of Tai). The unified rendering unit (figure 6(160) of Tai) renders the halftone image based on the blended halftone screen determined by the contrast index (CI) (column 9, lines 7-13 of Tai).

Tai does not disclose expressly that said digital logic circuit can also select at least a portion of the halftone image data and replicate the selected portion of the halftone image data to produce replicated halftone image data.

Crean further discloses that a digital logic circuit (figure 4(44) and column 6, lines 37-41 of Crean) selects at least a portion of the halftone image data and replicates the selected portion of the halftone image data to produce replicated halftone image data (column 7, lines 50-54 of Crean). The dot address sequencer (figure 4(44) of Crean) of the selected Holladay sequencer (figure 4(40) of Crean) replicates at least a portion of the halftone image data by laying out bricks in a tile format (column 7, lines 50-54 of Crean) with various offsets (column 7, lines 58-61 of Crean).

Tai and Crean are combinable because they are from the same field of endeavor, namely halftone image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to include for said digital logic circuit, taught by Tai, the additional option of selecting at least a portion of the halftone image data and replicating the selected portion of the halftone image data to produce replicated halftone image data, as taught by Crean. The motivation for doing so would have been that selecting and replicating said selected portion increases the efficiency and speed of the halftoning process (column 2, lines 40-43 of

Crean). Therefore, it would have been obvious to combine Crean with Tai to obtain the invention as specified in claim 5.

Regarding claim 8: Tai discloses a method comprising selecting one of a plurality of halftone screens (column 8, lines 18-20 of Tai).

Said method further comprises outputting data from the selected halftone screen (column 11, lines 32-35 and lines 41-43 of Tai). Outputting said halftone screen data inherently requires outputting address bits from said halftone screen data since the locations of the individual halftone dots are required in order to print.

Said method further comprises outputting halftone image data from a look-up table based on the selected halftone screen and the continuous tone image data (column 9, lines 59-65 of Tai).

Said method further comprises controllably processing the halftone image data based on the selected halftone screen (column 10, lines 2-10 of Tai).

Tai does not disclose expressly selecting one of a plurality of types of Holladay counters, the plurality of types of Holladay counters including at least one clustered dot counter and at least one stochastic dot counter; outputting address bits from the selected Holladay counter; outputting halftone image data from a look-up table based on the address bits from the selected Holladay counter, wherein the look-up table includes at least one clustered-dot halftone screen and at least one stochastic halftone screen; and controllably processing the halftone image data based on the selected Holladay counter.

Crean discloses selecting one of a plurality of Holladay counters (figure 9(40M,40N) and column 8, lines 23-31 of Crean).

Crean further discloses outputting address bits from the selected Holladay counter (column 8, lines 31-35 of Crean).

Crean further discloses outputting halftone image data from a look-up table (column 7, lines 10-12 of Crean) based on the address bits from the selected Holladay counter (column 7, lines 7-10 of Crean). Controlling the sequencing into the brick that describes halftone dot is inherently based on the address bits since the halftone dots have to be printed at a particular location in said brick.

Crean further discloses controllably processing the halftone image data based on the selected Holladay counter (column 8, lines 31-35 of Crean).

Tai and Crean are combinable because they are from the same field of endeavor, namely halftone image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the plurality of Holladay counters, along with the associated address bits, taught by Crean to tile, with various offsets, the halftone screens taught by Tai. The particular Holladay counter would be selected by the selection indicator (CI) since said selection indicator is used to determine the dot type used in the halftoning process. The motivation for doing so would have been to increase the efficiency and speed of the halftoning process (column 2, lines 33-37 of Crean). Therefore, it would have been obvious to combine Crean with Tai.

Tai in view of Crean does not disclose expressly selecting one of a plurality *of types* of Holladay counters, the plurality of types of Holladay counters including at least one clustered

dot counter and at least one stochastic counter; and that the look-up table includes at least one clustered-dot halftone screen and at least one stochastic halftone screen.

Wang discloses using a clustered-dot halftone screen (column 9, lines 60-63 of Wang) and a stochastic halftone screen (column 10, lines 45-50 of Wang).

Tai in view of Crean is combinable with Wang because they are from the same field of endeavor, namely halftone image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use clustered-dot halftone screens and stochastic halftone screens, as taught by Wang, in the look-up table taught by Tai. Further, since said Holladay counters are used to generate the state for indexing into the said halftone screens (column 8, lines 23-27 of Crean), the use of said clustered-dot halftone screens and stochastic halftone screens, as taught by Wang, in the look-up table taught by Tai would result in selecting one of a plurality of types of the Holladay counters taught by Crean since the proper type of Holladay counter would inherently have to be used in order to properly use the correct type of halftone screen. The motivation for doing so would have been that clustered-dot halftone screens are more color stable (column 9, lines 48-49 of Wang) and stochastic halftone screens provide more gray levels (column 9, lines 45-46 of Wang). Therefore, it would have been obvious to combine Wang with Tai in view of Crean to obtain the invention as specified in claim 8.

Regarding claim 11: Tai discloses using halftone screens (column 7, lines 28-32 of Tai).

Tai does not disclose expressly controllably processing the halftone image data, which comprises outputting the halftone

image data without processing the halftone image data, when the selected Holladay counter is the clustered dot halftone screen.

Crean discloses controllably processing the halftone image data, which comprises outputting the halftone image data without processing the halftone image data (column 6, lines 31-35 of Crean), when a particular Holladay counter is selected (figure 9(40M,40N,60) and column 6, lines 28-31 of Crean). The Holladay counter (also referred to as a "Holladay sequencer") simply outputs the halftone image data in a tiled brick format without processing said halftone image data (column 6, lines 31-35 of Crean). Each Holladay counter has its own particular output format (column 8, lines 31-35 of Crean).

Tai and Crean are combinable because they are from the same field of endeavor, namely halftone image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to controllably process the halftone image data with a selected Holladay counter. The motivation for doing so would have been to increase the efficiency and speed of the halftoning process (column 2, lines 33-37 of Crean). Therefore, it would have been obvious to combine Crean with Tai.

Tai in view of Crean does not disclose expressly that said Holladay counter is a clustered-dot halftone screen.

Wang discloses using a clustered-dot halftone screen (column 9, lines 60-63 of Wang).

Tai in view of Crean is combinable with Wang because they are from the same field of endeavor, namely halftone image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the clustered-dot halftone screen for the halftone screen of the Holladay counter. The motivation for doing so would have been

that clustered-dot halftone screens are more color stable (column 9, lines 48-49 of Wang). Therefore, it would have been obvious to combine Wang with Tai in view of Crean to obtain the invention as specified in claim 11.

Regarding claim 14: Tai discloses a method comprising selecting one of a plurality of halftone screens (column 8, lines 18-20 of Tai).

Said method further comprises outputting data from the selected halftone screen (column 11, lines 32-35 and lines 41-43 of Tai). Outputting said halftone screen data inherently requires outputting address bits from said halftone screen data since the locations of the individual halftone dots are required in order to print.

Said method further comprises outputting a set of threshold values from a look-up table (column 9, lines 44-49 of Tai) based on at least the selected address bits (column 9, lines 47-49 of Tai). Accessing the threshold values of a halftone screen at a particular location inherently requires the address bits of said location. Otherwise, the particular element of said halftone screen cannot be accessed.

Said method further comprises comparing each threshold value of the set from the look-up table to the continuous tone image data to produce halftone image data (column 9, lines 44-49 of Tai).

Tai does not disclose expressly selecting one of a plurality of Holladay counters; and outputting address bits from the selected Holladay counter.

Crean discloses selecting one of a plurality of Holladay counters (figure 9(40M,40N) and column 8, lines 23-31 of Crean).

Crean further discloses outputting address bits from the selected Holladay counter (column 8, lines 31-35 of Crean).

Tai and Crean are combinable because they are from the same field of endeavor, namely halftone image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the plurality of Holladay counters, along with the associated address bits, taught by Crean to tile, with various offsets, the halftone screens taught by Tai. The particular Holladay counter would be selected by the selection indicator (CI) since said selection indicator is used to determine the dot type used in the halftoning process. The motivation for doing so would have been to increase the efficiency and speed of the halftoning process (column 2, lines 33-37 of Crean). Therefore, it would have been obvious to combine Crean with Tai.

Tai in view of Crean does not disclose expressly that said look-up table includes at least one clustered-dot halftone screen and at least one stochastic halftone screen.

Wang discloses using a clustered-dot halftone screen (column 9, lines 60-63 of Wang) and a stochastic halftone screen (column 10, lines 45-50 of Wang).

Tai in view of Crean is combinable with Wang because they are from the same field of endeavor, namely halftone image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use clustered-dot halftone screens and stochastic halftone screens, as taught by Wang, in the look-up table taught by Tai. The motivation for doing so would have been that clustered-dot halftone screens are more color stable (column 9, lines 48-49 of Wang) and stochastic halftone screens provide more gray levels

(column 9, lines 45-46 of Wang). Therefore, it would have been obvious to combine Wang with Tai in view of Crean to obtain the invention as specified in claim 14.

Regarding claims 12 and 16: The arguments regarding claim 11 are incorporated herein. In order for said Holladay counter to be the clustered dot halftone screen, said Holladay counter must inherently implement said clustered dot halftone screen.

Regarding claims 13 and 17: Tai discloses using halftone screens (column 7, lines 28-32 of Tai).

Tai does not disclose expressly controllably processing the halftone image data, which comprises replicating a portion of the halftone image data to produce replicated halftone image data, when the selected Holladay counter implements the stochastic halftone screen.

Crean discloses controllably processing the halftone image data, which comprises replicating a portion of the halftone image data without processing the halftone image data to produce replicated halftone image data (column 6, lines 31-35 and column 7, lines 50-54 of Crean), when a particular Holladay counter is selected (figure 9(40M, 40N,60) and column 6, lines 28-31 of Crean). The Holladay counter (also referred to as a "Holladay sequencer") simply outputs the halftone image data in a tiled brick format without processing said halftone image data (column 6, lines 31-35 of Crean). Each Holladay counter has its own particular output format (column 8, lines 31-35 of Crean).

Tai and Crean are combinable because they are from the same field of endeavor, namely halftone image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to controllably process the halftone image data with a selected Holladay counter, as taught by Crean.

The motivation for doing so would have been to increase the efficiency and speed of the halftoning process (column 2, lines 33-37 of Crean). Therefore, it would have been obvious to combine Crean with Tai.

Tai in view of Crean does not disclose expressly that said Holladay counter implements a stochastic halftone screen.

Wang discloses using a stochastic halftone screen (column 10, lines 45-50 of Wang).

Tai in view of Crean is combinable with Wang because they are from the same field of endeavor, namely halftone image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to implement a stochastic halftone screen with the Holladay counter. The motivation for doing so would have been that stochastic halftone screens provide more gray levels (column 9, lines 45-46 of Wang). Therefore, it would have been obvious to combine Wang with Tai in view of Crean to obtain the invention as specified in claims 13 and 17.

Regarding claims 19 and 21: Tai in view of Crean does not disclose expressly that the plurality of Holladay counters includes at least one clustered-dot halftone counter and at least one stochastic halftone counter.

Wang discloses using a clustered-dot halftone screen (column 9, lines 60-63 of Wang) and a stochastic halftone screen (column 10, lines 45-50 of Wang).

Tai in view of Crean is combinable with Wang because they are from the same field of endeavor, namely halftone image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use clustered-dot halftone screens and stochastic halftone screens,

as taught by Wang, in the look-up table taught by Tai. Further, since said Holladay counters are used to generate the state for indexing into the said halftone screens (column 8, lines 23-27 of Crean), the use of said clustered-dot halftone screens and stochastic halftone screens, as taught by Wang, in the look-up table taught by Tai would result in selecting one of a plurality of types of the Holladay counters taught by Crean since the proper type of Holladay counter would inherently have to be used in order to properly use the correct type of halftone screen, and thus said Holladay counters would include at least one clustered dot halftone counter and at least one stochastic counter. The motivation for doing so would have been that clustered-dot halftone screens are more color stable (column 9, lines 48-49 of Wang) and stochastic halftone screens provide more gray levels (column 9, lines 45-46 of Wang). Therefore, it would have been obvious to combine Wang with Tai in view of Crean to obtain the invention as specified in claims 19 and 21.

9. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tai (US Patent 5,729,632) in view of Crean (US Patent 5,745,249) and Curry (US Patent 5,410,414).

Regarding claim 3: Tai discloses that the look-up table outputs halftone image data based on continuous tone image data (column 9, lines 37-41 of Tai).

Tai in view of Crean does not disclose expressly that said look-up table outputs high addressability halftone image data having a spatial resolution that is greater than a spatial resolution of the continuous tone image data.

Curry discloses outputting high addressability halftone image data (column 6, lines 41-47 of Curry) having a spatial

resolution (column 6, lines 48-52 of Curry) that is greater than a spatial resolution of the continuous tone image data (column 6, lines 58-62 of Curry).

Tai in view of Crean is combinable with Curry because they are from the same field of endeavor, namely halftone image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to output high-addressability, hyper-acuity halftone data for printing. The motivation for doing so would have been that the human visual system is more perceptive to printed image data than displayed image data (column 6, lines 34-39 of Curry). Therefore, it would have been obvious to combine Curry with Tai in view of Crean to obtain the invention as specified in claim 3.

10. Claims 7, 9 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tai (US Patent 5,729,632) in view of Crean (US Patent 5,745,249), Wang (US Patent 5,859,955), and Curry (US Patent 5,410,414).

Regarding claim 7: Tai discloses that the look-up table outputs halftone image data based on continuous tone image data (column 9, lines 37-41 of Tai).

Tai in view of Crean and Wang does not disclose expressly that said look-up table outputs high addressability halftone image data having a spatial resolution that is greater than a spatial resolution of the continuous tone image data.

Curry discloses outputting high addressability halftone image data (column 6, lines 41-47 of Curry) having a spatial resolution (column 6, lines 48-52 of Curry) that is greater than a spatial resolution of the continuous tone image data (column 6, lines 58-62 of Curry).

Tai in view of Crean and Wang is combinable with Curry because they are from the same field of endeavor, namely halftone image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to output high-addressability, hyper-acuity halftone data for printing. The motivation for doing so would have been that the human visual system is more perceptive to printed image data than displayed image data (column 6, lines 34-39 of Curry). Therefore, it would have been obvious to combine Curry with Tai in view of Crean and Wang to obtain the invention as specified in claim 7.

Regarding claims 9 and 18: Tai discloses that the look-up table outputs halftone image data based on continuous tone image data (column 9, lines 37-41 of Tai).

Tai in view of Crean and Wang does not disclose expressly that said look-up table outputs high addressability halftone image data having a spatial resolution that is greater than a spatial resolution of the continuous tone image data.

Curry discloses outputting high addressability halftone image data (column 6, lines 41-47 of Curry) having a spatial resolution (column 6, lines 48-52 of Curry) that is greater than a spatial resolution of the continuous tone image data (column 6, lines 58-62 of Curry).

Tai in view of Crean and Wang is combinable with Curry because they are from the same field of endeavor, namely halftone image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to output high-addressability, hyper-acuity halftone data for printing. The motivation for doing so would have been that the human visual system is more perceptive to printed image data

than displayed image data (column 6, lines 34-39 of Curry). Therefore, it would have been obvious to combine Curry with Tai in view of Crean and Wang to obtain the invention as specified in claims 9 and 18.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A Thompson whose telephone number is 703-305-6329. The examiner can normally be reached on 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K Moore can be reached on 703-308-7452. The fax phone number for the

organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

James A. Thompson
Examiner
Art Unit 2624

JAT
24 January 2005

THOMAS D.
LEE
PRIMARY EXAMINER